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I, JONNE YABSLEY, ACTING TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2002952999 for a patent by DAVID REES MUGELI as filed on 29 November 2002.

WITNESS my hand this
Sixteenth day of December 2003

JONNE YABSLEY
ACTING TEAM LEADER
EXAMINATION SUPPORT AND SALES



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DAVID REES MUGELI

FORM 9

COMMONWEALTH OF AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:

"METAL MACHINING AND DRILLING BITS"

This invention is described in the following statement:

METAL MACHINING AND DRILLING BITS

THIS invention concerns twist drills, router bits and like components which are normally held in three jaw chucks.

For both machining work and jobbing work the shanks of such bits are 5 cylindrical and they rely on the operator tightening the chuck jaws to grip the shank firmly enough to impart the necessary torque. When unexpected hardness in the substrate is met, the bit may bind in the bore slowing the bit while the chuck may continue to spin. This interrupts the drilling operation and damages the bit.

Tradesmen commonly dispense with the chuck key when tightening a bit in 10 the chuck, preferring to insert the required bit and then to grip the chuck briefly as it starts, using the torque of the drill to tighten the chuck. This helps to change bits quickly but chuck slip is common with such practice.

Spade bits have a single flat ground into the end 10mm of the shank, but to improve grip this is intended to be placed adjacent a chuck jaw so that one jaw will 15 close parallel to the flat.

In one aspect this invention provides a rotary bit with three, six, nine or twelve flats arranged on the insert end of the shank in order to present a surface with is parallel to each jaw of the three jaw chuck.

When six, nine or twelve flats are present, the flats may be contiguous. 20 When three flats are provided these may be mutually separated by arcuate portions of the shank in order to retain a substantial proportion of the section of the shank for taking the rotational force of the chuck. The flats and the arcuate separation of the flats may be of substantially equal sectors.

The flats may be machined, ground, or formed during manufacture.

Theoretically the best resistance to slippage occurs when there is a flat which mates with a closing jaw. Friction is independent of contact area and depends only upon the closing force and the coefficient of friction between the jaw and the shank. The shank is normally polished and therefore prone to slip, but the displacement of the jaw must occur before the shank can slip. Once flats have been provided on the shank physical displacement of the jaw is prevented. This ensures that chuck and shank rotate at the same speed rather than reliance upon friction.

Twelve seems to be the upper limit because a greater number begins to approximate to a circular section which is the cause of the slippage.

Certain embodiments of the invention are now described with reference to the accompanying drawings in which:-

Figure 1 is an end view of a partially open chuck;

Figure 2 is a larger scale section of a shank with six flats;

Figure 3 is a section of a shank with three flats; and

Figure 4 is a section showing a sheer off safety feature applicable to the present invention.

Referring to Figure 1 the three jaws 2 define a triangular space 4 into which the shank of a twist drill is inserted. In Figure 2 the flats 6 are ground in the insert end of an HSS shank 8 held in a tool head 10 which indexes. The flats produce a shank of hexagonal section.

In Figure 3 the flats 6 are ground on three equi-spaced sectors of the shank diameter. The arc 12 between the flats are equal in distance to the width of the flats.

Whilst the above has been given by way of illustrative example of the present invention many variations and modifications thereto will be apparent to those skilled in the art without departing from the broad ambit and scope of the invention as herein set forth.

For example the drill may include a sheer off safety feature. An example is shown in Figure 4 at 20 where the flats 21 as previously described are connected to the bit 22 via a wasted section 23 so that upon jamming of the bit in a workpiece the wasted section will twist sheer off.

DATE this 29th day of November 2002.

DAVID REES MUGELI
By his Patent Attorneys
INTELLPRO

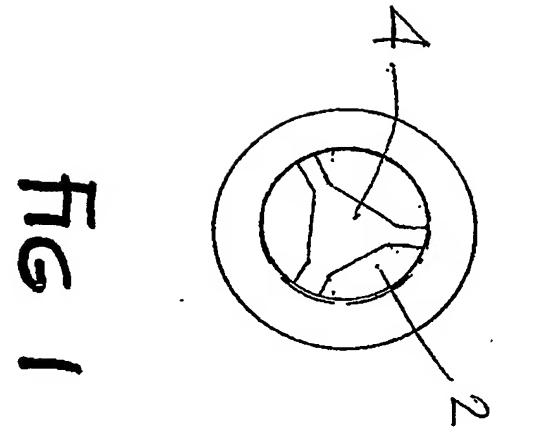


fig 1

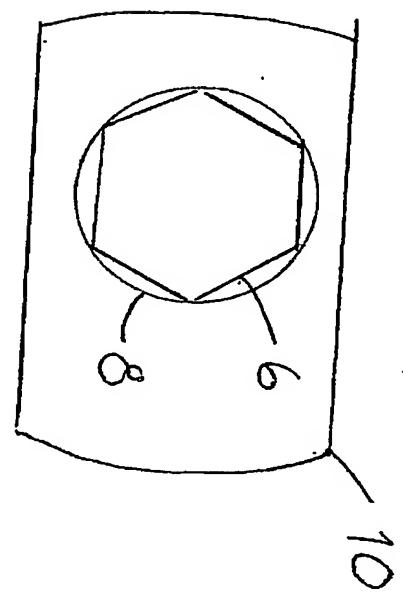


fig 2

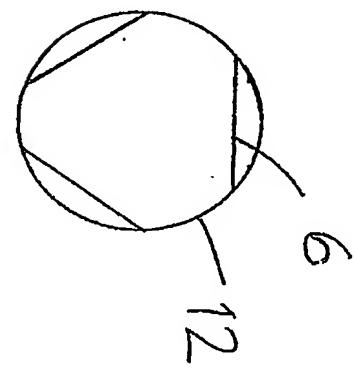


fig 3

